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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/512,088

11/09/2004

Naoki Sugano

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12/28/2005

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ALEXANDRIA, VA 22314

EXAMINER

HEINRICHS, CHRISTOPHER P

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/512,088

Applicant(s)

SUGANO ET AL.

Examiner

Christopher P. Heinrichs

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This communication is in response to the amendment of 12/9/2005. All changes made to the Specification, Drawings, and Claims have been entered. Accordingly, Claims 1-6 are currently pending in the application.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 5, and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by USPGPUB 2003/0127289 submitted by Elgas et al.
3. With regard to claim 1, Elgas discloses a rotation driving device (fig 6) for a construction machine (industrial truck, abstract, see fig 1) comprising an electric motor (fig 6 item 3) for driving a rotational system of said construction machine (hydraulic pump drive, paragraph 4), an operating member (fig 1 item 8) for instructing an operation of said electric motor, and a controller (fig 1 item 2) for controlling said electric

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motor according to an operation command from said operating member, wherein said controller has an emulation model (fig 6 items 20 and 21) for simulating dynamic characteristics (characteristic map is produced) of a hydraulic rotational driving device (the motor) in real time (during operation), and a target value for control is calculated by use of said emulation model (operating point, paragraph 80) according to the operation command from said operating member to control said electric motor (when operating member indicates motion is necessary).

4. With regard to claim 5, Elgas discloses all aspects of the invention of claim 1 and further discloses that the device include a built in battery (fig 1 item 11).

5. With regard to claim 6, Elgas discloses all aspects of the invention of claim 1 and further discloses that the rotational system includes a rotating system (hydraulic pump, paragraphs 37 and 65) having a rotating motor (as set forth above) as a driving source.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPGPUB 2003/0127289 submitted by Elgas et al. in view of US Patent 5,953,977 to Krishna et al.

9. With regard to claims 2 and 4, Elgas discloses all aspects of the invention of claim 1 and further discloses that the emulation model has specifications of the dynamic pump (motor model, fig 6 item 20, paragraph 68) but fails to explicitly disclose that the emulation model has specifications of a hydraulic actuator and various valves. However, Krishna discloses a rotation driving device for a construction machine (fig 1) that drives a hydraulic pump (col 2 lines 62-65) and has an emulation model that includes specification of a hydraulic actuator and various valves including non-linear characteristics for the valves (a valve is an actuator) (col 2 lines 20-30). It would have been obvious to one ordinarily skilled in the art at the time of the invention to combine the system disclosed by Elgas with the system disclosed by Krishna by adding the emulation model to drive the electric motor for the hydraulic pumps (fig 1 items 16 and 17) to arrive at the invention of claim 2. The motivation to do so would have been to

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provide for electrical excitation and efficient control of the pump motors in the apparatus disclosed by Krishna.

10. With regard to claim 3, Elgas and Krishna disclose the invention of claim 2. Krishna further discloses an input unit (look-up table) connected to said controller so that each of said specifications in said emulation model (col 2 lines 27-30) is changed through said input unit (col 5 lines 57-59).

### ***Response to Arguments***

2. Applicant's arguments filed 12/9/2005 with respect to claims 1-6 have been fully considered but they are not persuasive.

3. With regard to claims 1, 5, and 6, Applicant argues "the electric motor 3 operates a hydraulic pump for the lift (paragraph [0065]) and is controlled by an arithmetic unit 14 which includes a "drive model 20 that simulates the rotating field drive (of the motor) 3" (paragraph [0068]). Therefore, as Applicants pointed out during the interview, Elgas et al does not disclose an emulation model for simulating dynamic characteristics of a *hydraulic* rotational driving device in real time, but instead simply simulates the rotating field drive of the *electric* motor 3 which is being controlled." Examiner notes that the electric motor that Elgas controls develops pressure for operation of a hydraulic pump, as is apparent from the cited paragraph 65, making this motor a hydraulic rotational device; a device that rotates and serves a hydraulic purpose. The limitations of claims 1, 5 and 6 do not distinguish the invention of the instant application over Elgas.

4. Applicant further argues "the Examiners postulated during the interview that it may nonetheless have been obvious to have instead simulated a hydraulic rotational driving device in the driving model 20 of Elgas et al. However, such a modification would not have been obvious to those skilled in the art, if only because it would have rendered Elgas et al unsatisfactory for its intended purpose (GETHE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE"; M.P.E.P. j 2143.01). According to Elgas et al, the drive model 20 simulating the rotational field drive 3 determines the values of the flux linkage  $\Psi$ , the torque T and the rotational speed n of the electric motor (paragraph [0068]). These factors, including the flux linkage  $\Psi$ , may be used in very many ways for the drive control of the rotating field motor 3" (paragraph [0061]), for example to detect faults in the motor field 3 (paragraph [0066])." However Applicant's attention is again drawn to paragraph 65, which explicitly states "In addition, an important use is the use of the data determined to calculate the lifting load of the industrial vehicle 1, in that by using variables of torque T and rotational speed n, taking account physical laws, in particular, the efficiency of hydraulic pumps and the efficiency of the mechanism and the specific delivery volume of the hydraulic pump, the hydraulic pressure can initially be determined. Taking account of the cylinder area of the lifting cylinder and the transmission area of the lifting frame, the lifting load and the travel speed of the lifting frame can be determined." Inclusion of physical laws, cylinder area, transmission ratio, etc, makes it clear that dynamic characteristics on non-electric components of the

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hydraulic rotational device are *explicitly* used to calculate target values for control and that a rejection of claims 1, 5, and 6 as being obvious would not be necessary.

5. With regard to claims 2-4, Krishna uses models for the hydraulic devices to determine control of the hydraulic devices, including the hydraulic pumps 42 of fig 1, the plurality of hydraulic valves 18, 20, 22, and 24 of fig 1, and the hydraulic actuators 26, 28, 30, and 32, all of fig 1. It would be obvious to use the models of the devices in Krishna's system in Elgas' system, which already uses hydraulic models. The introduction of a plurality of valves and actuators will change the characteristic of the system being driven by the motor disclosed by Elgas. Said motor will still however need to be instructed to produce the appropriate torque  $T$ , which Elgas' controller controls, and it is well known that the physical laws of hydraulic devices determine the pressure of hydraulic fluid associated with said devices, said pressure generated by torque  $T$  delivered by the motor disclosed by Elgas.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


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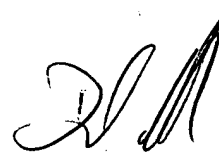
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Heinrichs whose telephone number is 571-272-8397. The examiner can normally be reached on Monday through Thursday, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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